

What is claimed is;

1. A planar reference electrode including plate (4);  
electrode connection part (1) ; electrode (3);  
5 insulating membrane (2); inner reference solution  
(5); junction (7 or 8); and the outer protection  
membrane (6, 8 or 9), wherein the junction  
comprises porous substance such as cotton thread,  
10 glass fiber, cellulose nitrate, cellulose acetate,  
filter paper and any material that can exhibit  
capillary action; porous polymer membrane; or a  
capillary either printed on the substrate or  
7 inserted with a thin film.

15 2. The planar reference electrode as set forth in  
claim 1, wherein the porous polymer membrane  
comprises cellulose nitrate.

20 3. The planar reference electrode as set forth in  
claim 1, wherein the plate (4) is selected from  
the group consisting of alumina, glass and plastic  
substance.

25 4. The planar reference electrode as set forth in  
claim 1, wherein the electrode (3) is selected  
from the group consisting of Ag, Pd, Cu, Pt,  
Ag/AgCl, Ag containing 1-5 weight% of Pd and Ag

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coated with Nafion.

5. The planar reference electrode as set forth in claim 1, wherein the inner reference solution (5) is the electrolyte containing hydrogel which consists of 85-99% weight% of glycerol solution; 1-19 weight% of agar solution; polymeric glue; or a soluble polymer dissolved with hygroscopic substance.

6. The planar reference electrode as set forth in claim 5, wherein the electrolyte is  $\text{AgNO}_3$  or perchloric acid for the Ag electrode,  $\text{KCl}$  or  $\text{NaCl}$  for the Ag/AgCl electrode, and  $\text{KOH}$  or  $\text{NaOH}$  for the mercury/mercury oxide electrode.

7. The planar reference electrode as set forth in claim 1, wherein the protection membrane (6, 8 or 9) is polymeric substance including polyester or porous polymer membrane.

8. A method for fabricating the planar reference electrode of claim 1 which comprises 7 stages;

(1) forming electrode connection part (1) on the plate (4);

(2) forming conductor lines (3) on the plate (4)

by using the screen printing method;

(3) forming insulating layer (2) by screen printing on the conductors (3) formed at step 2, while excluding electrode site and connection sites;

(4) forming insoluble metal salt layer on the electrode site;

(5) placing a thin film that can provide a well around the electrode site and a line of capillary onto the substrate;

(6) placing inner reference solution (5) within the well; and

(7) forming protection membrane layer (8) that can cover the inner reference solution.

9. A method for fabricating the planar reference electrode of claim 1 which comprises 6 stages;

(1) forming electrode connection part (1) on the plate (4);

(2) forming electrodes (3) on the plate (4) by using the screen printing method;

(3) forming insulating layer (2) by screen printing on the conductors (3) formed at step 2, while excluding the electrode site and connection site (1);

(4) forming insoluble metal salt layer onto the electrode;

(5) forming hydrogel layer (5) using soluble polymer containing highly concentrated electrolyte; and

(6) forming porous polymer protection membrane (9) on the hydrogel layer using porous polymer covering hydrogel layer completely.

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